

**Tired of Email? Examining the Role of Extraversion in Building Energy Resources
after Dealing with Work-Email**

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Abstract

Office-based work today involves dealing with email, despite being denigrated and lauded in almost equal measures. Using the Conservation of Resources theory we examine whether Extraversion (expressed through two facets) acts as a resource to explain the differential impact that work-email has on people's energy resources (relating to fatigue and boredom). An experience-sampling study was undertaken, whereby 54 knowledge-workers completed records of their response ($n = 589$) to new work-email over the course of a typical working day. Results were analyzed using hierarchical linear modelling (HLM). Participants who felt tired prior to dealing with email, reported that they felt more energized afterwards (but only if they were higher on Agentic extraversion). Work-email did not re-energize extraverts when they had been bored beforehand. By examining changes in energy resources, and by measuring different facets of Extraversion, we offer theoretical and methodological contributions to advancing understanding about the role of resources in dealing with work-email. Specifically, our results suggest that Extraversion may not constitutionally be a key resource within COR, because its value and contribution to resource building is contingent on context. Implications for practitioners concerned with how best to manage digital communications at work, are discussed.

Keywords: COR; resources; energy; email; Extraversion; Agentic and Affiliative extraversion

Introduction

Almost 50 years since the first electronic message was sent, digital communication now pervades modern work activity. From collaborative platforms such as Slack, Teams, Yammer and Google docs, to the continued proliferation of email (Tschabitscher, 2019), knowledge workers are seemingly engaged in a relentless stream of digital activity – ostensibly designed to make their work more flexible, efficient and convenient (Rosen, Simon, Gajendran, Johnson, Lee & Lin, 2018). The most ubiquitous form of work communication is email, with over 281 billion work email being sent per day in 2018, and 86% of professionals purporting this to be their favoured communication tool (Tschabitscher, 2019).

Research into the impact of work-email appears to be organized around two key, but contradictory, conclusions, specifically relating to resource-building and depletion. On the one hand, work-email (particularly incoming work-email) has been found to deplete people's psychological resources – resulting in experiences of work overload, compulsive use, stress, and work-family imbalance (Barley, Meyerson & Grodal, 2011; Charalampous, Grant, Tramontano & Michailidis, 2019; Mazmanian, Orlikowski & Yates, 2005). From this perspective, incoming work-email can be seen as a stressor that people struggle to cope with when resources are required and directed elsewhere (Barley et al., 2011; Brumby, Cox, Back & Gould, 2013; Czerwinski, Cutrell & Horvitz, 2000; Rosen et al., 2018; Speier, Vessey & Valacich, 2003). In contrast, from an energy-management perspective, research has shown that when resources at work are depleted, people can be re-energized after checking their email (Fritz, Lam & Spreitzer, 2011; Kinnunen, Feldt, de Bloom & Korpela, 2015; Zacher, Brailsford & Parker, 2014). Indeed, checking new email is the most commonly reported work-related within-day energy-management strategy (Fritz et al., 2011; Zacher et al., 2014), because it affords a break from existing resource depleting activity (Jett & George, 2003) and provides a novel stimulus to offset boredom and fatigue (Fisher, 1998; Russell, Millward

Purvis and Banks, 2007; Speier et al., 2003).

The extant research therefore suggests that incoming work-email will either be welcome (for those who conceive of work-email as having a replenishing effect on energy resources) or unwelcome (for those who conceive of work-email as having a depleting effect on energy resources), depending on the prior state of a worker's energy levels and individual differences in the extent to which a new, incoming stimulus (e.g. the work-email) is desirable. Whilst research into work-email activity has elucidated individual differences in strategies for dealing with work email, and how work-email differently affects different people (Huang & Lin, 2014; Rosen et al., 2018; Russell, Woods & Banks, 2017; Whittaker & Sidner, 1996), to date, individual differences have not been examined as a key mechanism in understanding whether incoming work-email boosts or depletes energy resources. A central aim of this paper is to extrapolate when, why and for whom work-email will have a resource building or depleting effect on people, so that managers and employees can be provided with guidance about the best ways to deal with this significant work demand.

In this study, we address this through the lens of Conservation of Resources (COR) theory (Hobfoll, 1989; Hobfoll, Halbesleben, Neveu & Westman, 2018) by focusing on the personality resource of Extraversion (Van Veldhoven, Van den Broeck, Daniels, Bakker, Tavares & Ogonnaya, 2020). Within the personality psychology research literature, people with higher levels of Extraversion are presented as needing, and being energised by, external sources of stimulation and social activity (Diener, Larsen, & Emmons, 1984; George, Helson & John, 2011; Smilie, Cooper, Wilt & Revelle, 2012). When compared with other personality traits, such as Neuroticism, only Extraversion is associated with lower levels of resting arousal and the seeking of stimulation (Furnham, 1984). Within the five-factor model of personality (Digman, 1990; McCrae & Costa, 2003), when a job requires higher levels of energy, including in teamwork scenarios, Extraversion is the only trait reported to be

activated (Tett & Burnett, 2003)ⁱ. This suggests that Extraversion (rather than other personality traits) is particularly likely to be important when considering how incoming work-email interacts with energy levels. If energy-levels are low, extravertsⁱⁱ, are more likely to actively look for ways to increase their energy and boost the extent to which they feel activated. We use repeated-measures diary records in a real-world field setting, to understand whether and how Extraversion interacts with energy resources in relation to people's responses to incoming work-email. Using this approach, we make three key contributions.

Our first contribution is to apply, and consequentially advance, COR theory in a widely accessible practical context, by broadening understanding of the role of personality traits in building or replenishing energy resources at work. There is some debate within COR as to the extent to which personality traits should be attributed the definition of a 'resource' because of their contextualised nature (Hobfoll et al., 2018; Russell et al., 2017; Thompson & Cooper, 2001). In this paper, our findings contribute to discussions within COR as to whether traits should be conceived of as key resources that facilitate resource gain, or whether a trait's application to build other resources (such as energy) is contingent on the appropriateness of the trait for the circumstance, thus limiting the extent to which it is considered a 'resource' *per se*. Our second contribution is to address methodological concerns that energy management research typically measures energy levels only after an event has occurred (Zhu, Kuykendall & Zhang, 2019). By using pre- and post- incoming work-email measures in this study, we identify whether changes in energy resources from before to after receiving work-email, can be directly attributed to dealing with the work-email; generally higher positive affect in extraverts (along with other variables) can otherwise confound post-stimulus energy ratings, when no pre-stimulus ratings are used (Smilie et al., 2012). Our third contribution is to examine the interactive effects of energy and Extraversion in a field setting, as individuals undertake their authentic work-email activity. This is in contrast to studies examining

excitation or energy after the presentation of a new stimulus in simulation or experimental settings (Fisher, 1998; Zijlstra, Roe, Leonora & Krediet, 1999). By asking participants to directly report on how energised they were, both before and after dealing with actual incoming work-email, we can be confident that recommendations for practice are based on ecologically valid findings.

In the sections below, we present an overview of COR, as the theoretical framework that positions our research, drawing out the salient features of the theory that drove our hypotheses generation in this context. We then go on to discuss the specific features of Extraversion and its role as a resource within COR and in this work-email context. Following from this we consider how energy resources at work are likely to interact with Extraversion, allowing us to predict who is likely to experience a boost to energy resources in a work-email context, and why.

COR Theory and the role of Stable and Volatile Resources

According to the Conservation of Resources (COR) theory (Hobfoll et al., 2018; Hobfoll, 1989), people are motivated to build, protect and invest in resources in order to stave off stress and achieve their valued goals (Halbesleben, Neveu, Paustian-Underdahl & Westman, 2014). A resource is considered to be anything that is centrally valued, and can be stable or volatile. Energy is a main category of resource within COR that can be lost when deployed, and replenished or built when people engage in recovery coping strategies (Hobfoll et al., 2018). As such, energy resources are classed as volatile or fluctuating (Ten Brummelhuis & Bakker, 2012). Within COR, an energy resource can include constructs such as time (Prapanjaroensin, Patrician & Vance, 2017), money (Hobfoll et al., 2018) and mood or well-being states (Halbesleben, Harvey & Bolino, 2009).

Personal characteristics are another key category of resource in COR, and are relatively stable. Personal characteristics (including personality traits) act as facilitators in

relevant contexts for building other resources (Hobfoll, 2002; Ten Brummelhuis & Bakker, 2012), although there is some debate as to whether personality traits should be classed as centrally valued resources by constitution (Hobfoll et al., 2018; Russell et al., 2017; Thompson & Cooper, 2001). This is because the extent to which they appear to be helpful in obtaining other resources or goals, seems to depend on the context (Deelstra, Peeters, Schaufeli, Stroebe, Zijlstra & van Doornen, 2003; Penney, Hunter & Perry, 2011; Winkel, Wyland, Shaffer & Clason, 2011). For example, whilst Extraversion is presented as a resource that generally helps people to control and influence their environment (Van Veldhoven et al., 2020), it has also been found to deplete other resources at work (e.g. attention: Judge & Zapata, 2015) or lead to negative outcomes (e.g. related to safety: Beus, Dhanani & McCord, 2015; Clarke & Robertson, 2005).

According to COR, people who are able to buffer against resource depletion do so by investing more context-relevant resources (Luria, Kahana, Goldenberg & Noam, 2019; Van Veldhoven et al., 2020), such as personality characteristics (Ten Brummelhuis & Bakker, 2012; Hobfoll, 2002; Hobfoll & Shirom, 2000). When environmental cues or goals are relevant to the properties of the personality trait, the trait is more likely to be activated and to add value in that situation (Barrick, Mount & Li, 2013; Tett and Burnett, 2003). This is significant in the context of COR, in relation to resource building and investment. According to principle 1 of the theory, people feel resource loss more acutely than resource gain. Therefore, in situations where a resource has been depleted, this is likely to elicit a cue to trigger the application of other resources that could be useful to help restore the loss. This also ties into COR principle 2, that people act in order to recover from resource loss, with those who have greater (more relevant and applicable) resources more likely to experience resource gain.

When applied to the context of work-email use and energy resources, this reasoning

implies that when an incoming work-email arrives, those who possess resources that are cued by energy loss and a desire for new stimuli, maybe more likely to be primed to see this as an opportunity to bolster energy resources. Extraversion is the personality trait in the FFM most likely to be cued by energy loss (Tett & Burnett, 2003). In other words, when energy levels are low, extraverts may be especially attuned to this and will be looking for ways in which they can rectify it. For example, if an extraverted person is feeling bored, and a new work-email pings into their inbox, they may see this as an opportunity to engage with something new and potentially energising. From a COR perspective then, Extraversion may predict the differently boosting or depleting effect that work-email has on people's energy resources.

In conceptualising energy resources, we refer to the mood states most commonly referenced in the energy management literature (Fritz et al., 2011; Zacher et al., 2014): the bipolar constructs of (a) boredom-enthusiasm and (b) fatigue-vitality. Higher levels (towards enthusiasm and vitality) indicate greater presence of energy resources, and lower levels (towards boredom and fatigue) indicate fewer energy resources being available. These energy terms reflect mood states associated with being in a high (enthusiasm and vitality) or low (boredom and fatigue) state of activation, and pleasurable (enthusiasm and vitality) or unpleasant (boredom and fatigue) associated affect. In the section below, we consider in more detail whether (and how) Extraversion could be considered to be a key resource that will be helpful in boosting such energy resources in the context of dealing with new incoming work-email.

Extraversion as a Resource for Boosting Energy Resources when Dealing with Incoming Work-email

Extraversion is a broad, higher level construct within personality Psychology (McCrae & Costa, 2003). People with higher levels of Extraversionⁱⁱⁱ have a low tolerance for under-stimulation or low energy levels (Furnham, 1984; Geen, 1984; Oishi & Choi, 2020).

They are more likely to suffer boredom/fatigue at work (Gardner, Cummings, Dunham & Pierce, 1998; Hill, 1975) and will be more energized by novel activity (Fisher, 1998; Furnham & Allass, 1999; Thayer, Newman & McClain, 1994). Because Extraversion is associated with being energized and fun-loving (McCrae & Costa, 2003), and is characterized by positive hedonic tone (Cote & Moskowitz, 1998; Kuppens, Oravecz & Tuerlinckx, 2010), higher levels of Extraversion are associated with higher levels of positive energy after any event (Bakker, Van der Zee, Lewig & Dollard, 2006), but specifically when the event affords the achievement of a rewarding goal (Smilie et al., 2012). In assessing what characteristics of one's job role or environment are likely to activate each of the traits of the FFM, only Extraversion was associated with a need for energy, and a preference for job demands that require this (Tett & Burnett, 2003).

Incoming work-email is a stimulus that could provide the opportunity to attain rewarding goals for extraverts. Work-email provides additional stimulation and also affords an opportunity to engage in social communication and goal pursuit (Nurmi, 2011; Renaud, Ramsey & Hair, 2006). As such, it seems likely that those with higher levels of Extraversion will be bolstered by engaging with a new work-email, but the mechanism responsible for this is likely to differ at a facet level. Extraversion comprises two key facets, relating to 'Agentic' and 'Affiliative' extraversion. (Depue & Collins, 1999; Eid, Riemann, Angleitner & Borkenau, 2003). According to Grodin & White (2015), "Agentic extraversion involves incentive motivation and is expressed as a tendency toward assertiveness, persistence, and achievement. Affiliative extraversion involves the positive emotion of social warmth and is expressed as a tendency toward amicability, gregariousness, and affection" (p.321). Because these facets are differently related to goal-oriented activity, stimulus responding and subsequent energy levels (Grodin & White, 2015; Morrone-Strupinsky & Depue, 2004), as resources they may act in different ways (see paragraph below). Previous research suggests

that Agentic and Affiliative extraversion, “tend to be positively correlated on the order of +.2 to +.3 in most studies..., though a range of larger and smaller correlations have also been observed” (Grodin & White, 2015, p.321).

Agentic extraversion is associated with motivation and positive activation, in that stimuli associated with the pursuit of goals will produce more activated energy levels (Morrone-Strupinsky & Depue, 2004). Affiliative extraversion however is associated with warmth, gregariousness and affection, and so socially rewarding stimuli is likely to produce positive valence, though not necessarily result in more activated energy (Morrone-Strupinsky & Depue, 2004; Smilie et al., 2012). Incoming work-email is a novel stimulus that has goal achieving properties (Sasangohar, Donmez, Trbovich & Eastey, 2012; Walji, Brixey, Johnson-Throop, and Zhang, 2004). It would therefore be expected that whilst both Affiliative and Agentic extraverts will be boosted by dealing with a new stimulus, the resource of Agentic extraversion is most likely to be cued by the arrival of a new work-email, because of the propensity towards task-goal fulfilment and the need to feel active. Affiliative extraverts are also likely to respond well to new external stimulation. However, the aforementioned research suggests Affiliative extraverts may be less likely to be cued by a stimulus that – as per work-email - is characterised by goal-achieving properties, rather than opportunities to engage in warm, positive social exchanges. Affiliative extraverts may consequently be less strongly disposed to and rewarded by attending to work-email, compared to their Agentic extravert counterparts. Therefore, we expect the strength of the relationship between Affiliative extraversion and post-email energy levels to be significant, but lower, than for Agentic extraversion. This shapes our first hypotheses:

H1a: Higher levels of Extraversion will predict higher levels of energy resources for enthusiasm after dealing with an incoming work-email, and this effect will be stronger for Agentic extraverts compared to Affiliative extraverts.

H1b: Higher levels of Extraversion will predict higher levels of energy resources for vitality after dealing with an incoming work-email, and this effect will be stronger for Agentic extraverts compared to Affiliative extraverts.

We also wanted to examine whether prior levels of energy resources moderated the extent to which extraverts achieved higher levels of energy after dealing with new, incoming work-email. As such, we were mindful of methodological issues raised by Zhu et al. (2018). In studies examining how stimuli influence energy levels, Zhu et al. note that these rarely compare prior energy levels to post-stimulus energy levels. Without prior measures of energy, higher levels of energy recorded after an event could be falsely attributed to the event, when in fact it has been confounded by positive dispositions or other variables (Zhu et al., 2018). This suggests that in examining whether work-email might have a different impact on different people's energy levels, research needs to ensure that both pre- and post- energy levels are recorded.

We propose that because those with higher levels of Extraversion are less tolerant of low energy levels, being in a state of boredom or fatigue prior to dealing with a new work-email is likely to moderate the relationship between Extraversion and energy levels afterwards. In particular, we expect that energy levels will more greatly improve for Agentic extraverts (compared to Affiliative extraverts) who felt bored or tired beforehand. This is because Agentic extraverts are more likely to be cued by their need to feel more activated and the opportunity to achieve this state by the arrival of a stimulus that allows them to work on a task goal (Depue & Collins, 1999; Grodin & White, 2015; Morrone-Strupinsky & Depue, 2004). Although, Affiliative extraverts are still likely to be cued by the presence of a new stimulus that could re-energise them, we hypothesise that effects are likely to be less pronounced than for Agentic extraverts because the work-email stimulus has less trait-relevance, in terms of attending to needs for warm, affiliative and affectionate exchanges.

Hypothesis 2a: A positive, significant relationship between Extraversion and higher levels of enthusiasm after dealing with incoming work-email will be stronger if enthusiasm levels were lower beforehand. This effect will be stronger for Agentic, compared to Affiliative extraverts.

Hypothesis 2b: A positive, significant relationship between Extraversion and higher levels of vitality after dealing with incoming work-email will be stronger if vitality levels were lower beforehand. This effect will be stronger for Agentic, compared to Affiliative extraverts.

In the present study, we used repeated-measures diary records to examine fluctuating levels of energy in response to incoming work-email in a real-world field environment. By also measuring Agentic and Affiliative extraversion, we were able to establish the extent to which different outcomes in post-email energy could be predicted by these different traits. Using COR, we suggest that new, incoming work-email is likely to be welcomed by those with higher levels of Extraversion, because of their greater need for stimulation, goal-achievement and variety, but we anticipated that this would be especially so if energy levels were low beforehand. At such times, we predicted that Extraversion would act as a resource to build depleted energy levels, in the presence of a work-email stimulus. By separating Affiliative and Agentic extraversion, we could identify whether any resource-building properties of Extraversion can be differentiated at a facet level (as the two elements of Extraversion suggest a different propensity for work-email to be stimulating). By undertaking this research within people's actual work environments, dealing with their authentic work-email, we provide a novel practical application of COR that provides ecological validation to the findings that emerge.

Method

Using Event Sampling Methodology (ESM) during one working day, we measured Participants' within-person responses relating to energy levels both before and after receiving

a new work-email, recorded in their authentic work context (Gabriel et al., 2018). Between-person measures of Extraversion facets were also measured, one-week prior to the study day, and were related to the fluctuating energy experiences.

Participants

Six organizations provided 61 participants for this study, via opportunity sampling across researcher networks by email. A £50 prize draw incentive was offered. Seven study participants were excluded for not completing measures at both data collection waves (before and on the study-day). The final number of participants was 54, with 6% at senior management grade, 39% at middle or project management level, 30% between administrative and management levels, and 24% at administrative level. Participants were from a range of industry sectors, including insurance (35%), architecture and design (11%), overseas development (37%), the media (11%), and accountancy (6%). 70% of participants were female. The modal age range of participants was 21-30 (43%).

Procedure

Participants recorded their response to each naturally-occurring new, incoming email that arrived over a full working day (self-nominated within a two-week window) on paper-based record sheets (as per Elfering, Grebner, Semmer, Kaiser-Freiburghaus, Lauper-Del Ponte & Witschi, 2005; Louro, Pieters & Zeelenberg, 2007; Russell et al., 2017). Participants were asked not to record email that (i) was already in their inbox, (ii) which arrived when they were not engaged in another task or (iii) arrived when they were already in the email system dealing with other email. On the study day, participants completed record sheets immediately after attending to each new work-email (as per the criteria above). An average of 11 new, incoming email were reported on per participant. The diary captured information about the work-email, along with reports of pre- and post-email energy. Participants completed a personality questionnaire online within 1-week prior to the designated study

period.

Measures

Control measures

Participants were asked to record the *Email Number* they had just attended to on each of their diary forms, as the cumulative impact of email can affect responses (Baethge, Rigotti & Roe, 2015). To control for *Email Demands* participants indicated “whether the email you just dealt with was ‘Lengthy’, ‘Difficult’, ‘Clear and Specific’ or ‘Important to you’”, rating each on a 6-point scale where 1 = ‘not at all’ and 6 = ‘very much’. Ratings were averaged (“Clear and Specific” was reverse scored) and high scores indicate high demands. *Email Valence* was measured as participants indicated whether “the content of the email you just dealt with was ‘Positive’, ‘Negative’ or ‘Neutral’” (recoded 1-3; 3 = positive; 2 = neutral; 1 = negative).

Energy resources

Energy was measured across two constructs of ‘Fatigue-Vitality’ (FV), and ‘Boredom-Enthusiasm’ (BE) using Daniels’ (2000) short-form scales. FV and BE are conceptually aligned with high energy (vitality and enthusiasm) in the positive direction, and low energy (fatigue and boredom) in the negative direction (Fritz et al., 2011; Ohly, Goritz & Schmitt, 2017; Zacher et al., 2014). Two items were summed to measure FV (“Tired”, reversed; and, “Active”) and two items were summed to measure BE (“Bored”, reversed; “Motivated”). Participants used a six-point scale to rate the extent to which ‘you feel this way right now, that is, at the present moment’ (where 1 = ‘not at all’ and 6 = ‘very much so’), indicating *After BE* and *After FV*. Participants used the same six-point scale to rate ‘how you felt right before being interrupted by the email alert’, indicating *Before BE* and *Before FV*. ‘Before’ variables were used as main effect variables, and as part of interaction terms, in Models 1 and 2; ‘After’ variables were the outcome variables for Models 1 and 2.

Extraversion

Extraversion was measured using the Hogan Personality Inventory (HPI; Hogan & Hogan, 1997). This is a 206-item questionnaire, based on the Five-Factor Model (FFM) of personality. It uses a forced choice, true-false response format and is fully standardized and validated for a working population (Hogan & Hogan, 1997; Salgado, 2003). There are seven primary scales; one of which measures Affiliative extraversion and is labelled Sociability (24 items), another measures Agentic extraversion and is labelled Ambition (29 items). The conceptualisation of HPI Sociability and Ambition as representing Affiliative and Agentic extraversion has been previously noted by Morrone-Strupinsky & Depue (2004). High scores on each scale are indicative of a high level of Extraversion. Participants completed the HPI using on-line administration and scoring software. Affiliative and Agentic extraversion variables were used as main effect variables and as part of interaction terms in both Models 1 and 2^{iv}.

Analysis

Random coefficient Hierarchical Linear Modelling (HLM) was used to test our hypotheses, using MLWiN version 3.02 (Rasbash, Browne & Charlton, 2018), and iterative generalised least squares (IGLS) estimation. Repeated measures from the diary records comprised the level-1 data (n=589), nested within the individual participants (N=54) at level-2. Level-1 variables were person-mean centred. Level-2 variables were converted to the z-scale. We used a stepped approach, with improvement in model fit identified using changes in chi squared between each step.

Results

On the study day, between 1 and 29 new, incoming email were received per participant, with a mean of 10.89 (median = 10; for descriptive statistics, see Table 1^v). Participants were notified of the new email by a floating message box (41%), an audible alert

(43%), and/or an envelope icon appearing on-screen (57%). Two cross-level models with interaction terms were run (Tables 2-3).

[ENTER TABLE 1 ABOUT HERE]

In Model 1 (Table 2), the null model suggests that around 25% of the variance can be explained by level 1 (within-person) factors. After entering controls (in Step 1), in Step 2, Affiliative extraversion was non-significant ($\gamma_j = -0.35$; $p = .07$) but Agentic extraversion ($\gamma_j = 0.60$; $p = .01$) was found to be a significant predictor of After BE. Before BE was also significant at Step 2 ($\gamma_{ij} = 0.29$; $p < .001$). This partially supports Hypothesis 1a. In Step 3, Before BE was not significant as an interaction term with Affiliative extraversion ($\gamma_j = -0.02$; $p = .30$). However, Before BE as an interaction term with Agentic extraversion was a significant predictor of After BE ($\gamma_{ij} = -0.17$; $p < .001$), lending support to Hypothesis 2a. To test this further, a simple slopes analysis for a 2-way multi-level model (with cross-level interactions) was run (Preacher, Curran & Bauer, 2006). Figure 1 presents the plot of the interaction, and the slopes analysis shows that Agentic extraversion is not significantly related to After BE when Before BE is low (2SD below the mean: $\gamma = -0.022$; $p = .93$). However, Agentic extraversion is significantly and negatively related to After BE when Before BE is high (2SD above the mean: $\gamma = -1.66$; $p < .001$) and at a mean level ($\gamma = -0.84$; $p < .001$). As such, Hypothesis 2a cannot be supported.

[ENTER TABLES 2-3 ABOUT HERE]

In Model 2 (Table 3), the null model suggests that around 31% of the variance can be explained by level 1 (within-person) factors. After accounting for controls, At Step 2, Affiliative extraversion ($\gamma_j = -0.42$; $p = .02$) and Agentic extraversion ($\gamma_j = 0.76$; $p < .001$) were found to significantly predict After FV. The relationship between Affiliative extraversion and FV is in the opposite direction to that expected. Together with the results from Model 1, there is support for Hypotheses 1a and 1b, but only relating to Agentic

extraversion. In relation to Affiliative extraversion, Hypotheses 1a and 1b are not supported.

At Step 2, Before FV was also significant ($\gamma_{ij} = 0.49$; $p < .001$). At Step 3 in Model 2, the interaction terms of FV with Affiliative extraversion and Agentic extraversion respectively were both significant: Affiliative extraversion x Before FV ($\gamma_{ij} = -0.17$; $p = .01$); Agentic extraversion x Before FV ($\gamma_{ij} = -0.13$; $p < .001$). The slopes analysis was run as before and shows that Affiliative extraversion is significantly and negatively related to After FV when Before FV is low ($\gamma = -0.62$; $p < .001$), high ($\gamma = -1.25$; $p < .001$) and at a mean level ($\gamma = -0.94$; $p < .001$). See Figure 2. These findings do not support Hypothesis 2b.

Figure 3 presents the plot of the Agentic extraversion x Before FV interaction, and the slopes analysis shows that Agentic extraversion is significantly related to After FV when Before FV is low ($\gamma = 0.39$; $p = .05$) and high ($\gamma = -0.78$; $p < .001$), but not at a mean level ($\gamma = -0.20$; $p = 0.33$), offering support to Hypothesis 2b.

[ENTER FIGURES 1-3 ABOUT HERE]

Discussion and Conclusions

The extant literature suggests that work-email has a differential impact on people's energy levels at work. In this paper we found that after dealing with new, incoming work-people's energy resources were either bolstered or depleted, and that Extraversion could delineate these effects, including in terms of how it interacts with energy levels prior to engaging with the work-email. However, not all of our findings were anticipated, and this is partly due to how Affiliative and Agentic extraversion differently interacted with two different 'types' of energy.

In essence, we found that Agentic extraversion predicts vitality and enthusiasm, after dealing with an incoming work-email, in line with our predictions and offering support to Hypotheses 1a and 1b. This supports the notion that dealing with work-email can offer reward properties relating to work-goal achievement, that is energising for those with higher

levels of Agentic extraversion. However, Affiliative extraversion predicted lower vitality (fatigue) after dealing with an incoming work-email, contrary to expectation, leading us to reject Hypotheses 1a and 1b overall. Although we expected that Affiliative extraverts would be less energised by work-email than Agentic extraverts, we did not anticipate that work-email would actually deplete energy resources for those with Affiliative extraversion.

In examining our moderator hypotheses, we found that, for Agentic extraverts, vitality levels after the email were heightened, the more fatigued they had felt beforehand, indicating that the work-email was directly involved in bolstering depleted energy resources, as predicted (offering support to Hypothesis 2b). However, those with higher levels of Affiliative extraversion, became more fatigued after dealing with work-email, with lowest levels of vitality noted when they had been fatigued beforehand. This indicates that work-email exacerbated resource loss (not supporting Hypothesis 2b overall). Further, enthusiasm levels after the email did not increase when Agentic extraverts had been bored beforehand (refuting Hypothesis 2a). Indeed, when energy resources were high beforehand, both vitality and enthusiasm decreased more for those with higher levels of Agentic extraversion. Our findings contribute to COR theory and the energy management and personality literature in several ways. Primarily, our findings allow us to challenge some of the commonly held beliefs relating to Extraversion, energy and work, and are outlined in the sections below.

Implications for understanding Extraversion as a resource

It is apparent from our findings that Extraversion should not be considered a universally valued key resource. Rather, Extraversion appears to be a contextualised resource (Judge & Zapata, 2015) that only has value in terms of how its facets assist in building other resources in response to specific, trait-relevant cues. Only the Agentic component of Extraversion was found to be helpful for restoring deficient volatile energy resources – specifically vitality – in response to the incoming work-email stimulus. Affiliative

extraversion was not helpful in building energy resources, and in fact the lowest levels of vitality were reported when they were already fatigued. This is interesting when we examine principle 2, corollary 1 of COR related to resource loss spirals. When people possess relevant resources, resource loss spirals (when depletion leads to more depletion) can be interrupted if the relevant resource is invested. Agentic extraversion appears to be a relevant resource in the context of dealing with work-email; its investment meant that existing lower levels of fatigue did not deplete further in the presence of a new work stimulus, but rather energy levels (towards vitality) were boosted. On the other hand, Affiliative extraversion does not appear to be a relevant resource. When vitality levels were low they remained low after dealing with email. This suggests that in a low-energy state, the presence of a new work-email will not cue Affiliative extraverts or result in them experiencing an energy boost. We suggest this is due to the features of the stimulus. Work-email is unlikely to be associated with trait-rewarding properties for the Affiliative extravert. Indeed, work-email may be considered too basic a form of communication, offering little challenge to the Affiliative extravert, who is likely to be especially competent at engaging in communications that involve more social cues and nuances than the text-based format of email. Research by Loukidou, Loan-Clarke & Daniels (2009) suggests that when people have mastery over a task (as the Affiliative extravert may have over communicating by email) it no longer requires conscious effort and can result in reduced levels of stimulation or activation. So, whilst it is something novel to deal with, an email probably doesn't offer enough excitement, challenge or reward to an Affiliative extravert, and hence the trait cannot be considered a resource in this context.

Interestingly and unexpectedly, in all of our slopes analysis, higher levels of energy resource were found for those with lower levels of both Extraversion facets (i.e. introverts) after dealing with work-email. To our knowledge, Introversion has not been presented as a 'resource' within COR to date, potentially because low levels of traits in the FFM are not

considered to be desirable or helpful in work contexts (Barrick et al., 2013). Yet, Introversion appeared to be helpful in obtaining high levels of vitality and enthusiasm after dealing with new, incoming work-email. The notion that a previously overlooked (or undesirable) trait could in fact be helpful in resource building is not new to COR (Winkel et al., 2011); further research and theorising around the construct of Introversion would now be helpful to establish whether, and why, this could be a useful contextual resource in dealing with work-email. This is especially because low-FFM trait characteristics are often overlooked in models predicting how personality will be cued, activated or rewarded in the context of work (Barrick et al., 2013; Tett & Burnett, 2003).

Within COR this implies that it is unhelpful to classify personality traits – and Extraversion in particular – as key resources. Their value is dependent on the context, and on times, they could even contribute to resource loss. We therefore agree with Hobfoll et al. (2018) that more research is needed to understand the role that personality plays in resource building and depletion, given that not all personality traits that have been classed as resources, will be helpful to workers in most situations, most of the time (Luria et al., 2019; Penney et al., 2011; Russell et al., 2017). It may therefore be necessary to categorize personality traits as a unique type of ‘conditional’ resource that, unlike other resources, do not have normative value, but are dependent on the situation and a person’s state, to show their worth (Hobfoll, 2002). Future research could now focus on which traits are cued by which situations in order to predict when different personality traits (at high and low ends of the FFM) are likely to be helpful for building other resources. Hobfoll et al (2018) emphasise the necessity of predicting in advance what will be a resource, and how it will contribute to stress reduction, in any effective and scientific model of stress.

Extraversion and the need for stimulation

Within the domain of personality psychology, excitement- or novelty-seeking is

considered to be an important component of the Extraversion trait (Costa & McCrae, 1992). Some (more traditional) views of Extraversion, suggest that levels of excitation need to be continually stoked in extraverts, to prevent boredom and tiredness (Eysenck, 1967). For Agentic extraverts, our findings would apparently concur with this, in that they experienced reduced levels of boredom and fatigue after dealing with an incoming work-email, and experienced higher vitality levels if they had been more fatigued beforehand. However, those with higher levels of Affiliative extraversion did not experience changes in boredom as a result of dealing with an incoming work-email, but they did become more fatigued, and this was intensified by previous levels of fatigue (i.e. fatigue became more pronounced). We can also see that, when vitality levels were higher beforehand, Agentic extraverts were more fatigued afterwards (see Figure 3). It is therefore apparent that 'Extraversion', as a broad trait, is not synonymous with a need for stimulation. Our findings suggest that the need for stimulation depends upon one's previous state, and how this interacts with facets of Extraversion, which – to our knowledge – have not been differentiated in studies of work stimulation-need in the past.

Why work-email is depleting to Affiliative extraverts requires further research. It is clear from our results that the need for stimulation does not result in Affiliative extraversion being used as a resource to respond to new work-email and bolster energy levels. We suggested above that work-email may not provide enough of a challenge to activate energy levels in Affiliative extraverts, because they are already 'masters' at communication, and do not find enough cognitive stimulation – relating to their need for warm, affectionate engagement – in a text-based format (Loukidou et al., 2009). It may be that work-email detracts from (rather than provides) opportunities to socially connect with the sender (i.e. because the communication properties of email do not engage the sociable worker: Bosch, Sonnentag & Pinck, 2018). Further, if email is seen primarily as a work rather than

pleasurable task, then some research suggests that engaging in work tasks during a ‘break’ from primary activity is fatiguing rather than revitalizing (Trougakos, Hideg, Cheng & Beal, 2014; Trougakos & Hideg, 2009). Our findings suggest this is especially so for those who do not explicitly value the achievement of work goals (i.e. the Affiliative extravert).

It may also be interesting to further consider how non-Affiliative introversion is involved in building energy resources when people are under-stimulated. Our slopes analysis shows that non-Affiliative introverts showed increased levels of vitality after dealing with work-email at all levels of previous energy resource. This may be because dealing with work-email offers a challenge to those who are less adept at communicating, thus activating them, and resulting in a reduction in fatigue and boredom (Loukidou et al., 2009). If we assume that introverts have more difficulty communicating (McCroskey & Richmond, 1990), then this presents a plausible rationale for why Introversion could actually be a resource in this context. A new email may encourage a low energised introvert to apply concentration and effort, to unpick the meaning in the email, which then bolsters energy afterwards. This could be especially salient for the Affiliative introvert who may be particularly lacking in the skills needed to interpret the social underpinnings of an exchange. Unpicking the specific motivations of different components of Extraversion and Introversion can help to explicate our results, supporting Woods and Anderson’s (2016) view that higher order factors of personality are often less helpful than sub-factors in predicting work-based outcomes. We also highlight the importance of attending to low FFM traits when producing theory on how personality may or may not act as a resource in work-situations (Judge & Zapata, 2015). The qualities and motivations of introverts should not be assumed as simply being the opposite to, or omission of, Extraversion. Research that pays attention to the commission of actions and motivations associated specifically with characteristics of Introversion, is more helpful when understanding more about its potential role as an active resource.

Methodological implications for research on energy change

In addition to the theoretical implications of our work in relation to COR and personality research, our study also contributes to the literature by demonstrating how important it is to explicitly measure change when examining fluctuations in energy resources. If we had only examined main effects, we would have concluded from our results that a higher level of Agentic extraversion is associated with greater enthusiasm *and* vitality after dealing with a novel stimulus. This would have supported the notion that dealing with email is effective at bolstering energy (Fritz et al., 2011; Zacher et al., 2017), for Agentic extraverts. However, by measuring the interacting effects of prior levels of energy we show that only when tired beforehand do those with higher levels of Agentic extraversion feel more energized afterwards. In previous studies, higher ‘after-event’ energy levels may have been interpreted as indicative of extraverts being energized by novel stimuli, when in fact they were simply expressing higher levels of positive energy (compared to introverts), regardless of what event had preceded it. This could have been a confound of the positive emotionality inherent to the Extraversion trait (Cote & Moskowitz, 1998; Depue & Collins, 1999; Kuppens et al., 2010). Our research therefore offers a methodologically advancing contribution to the study of energy and Extraversion at work.

Limitations and future research

As per Hunter & Wu (2016) participants retrospectively recalled their pre-email energy levels when rating their post-email levels. This allowed the rating to be taken close in time to the original state, with participants mentally registering their energy state when interrupted (knowing that they would be asked to record it later). This is considered to be an acceptable method for capturing changes in energy levels (Zhu et al., 2018), especially when one cannot predict when the new stimulus will occur (and therefore when to take the pre-stimulus rating). However, in future studies, energy levels prior to the emergence of the

stimulus could be captured, perhaps using objective, physiological monitors. We also recommend that both pre- and post- stimulus/event energy levels are measured in all future energy change research, to ensure that change is not assumed, or subject to confounds.

Further, we strongly encourage researchers to measure sub-factor elements of personality and energy, when researching how these impact resource building and depletion. This would enable scholars to predict the likelihood of resource change in response to events/activity, based on the pre-existing states, motivations and resource needs of different personalities (Barrick et al., 2013; Eid et al., 2003). Such an approach serves to develop a more granular understanding about how resources and personality interact in real world work activity.

Finally, whilst we note that our opportunity sample represents a range of industry sectors and job levels, we do not assert that are results will be broadly generalisable to other workers, or those within specific occupational settings (e.g. high work-email cultures). We did not record people's job roles, and note that there were more females than males in our sample. Our participants also reported an average of 11 new, incoming email across the study day. Whilst this suggests that our participants were unlikely to have been overloaded by our design, we acknowledge that workers experiencing higher levels of incoming email may have selected themselves out of the study. Designing research studies that apply an ESM approach to recording responses, without negatively impacting response protocols in workers who experience much higher levels of incoming work-email in the field, is a challenge. However, we encourage researchers to rise to this challenge to encourage a future focus on how work-email impacts energy resources in the real-world, that can be generalised beyond this context.

Practical implications

Digital communications continue to proliferate and interrupt people at work, in many different forms. Our research suggests that the extent to which these will be energy depleting

or energy boosting depends on personality differences between people (particularly in terms of different components of Extraversion) and existing levels of energy resources. As such, practitioners, managers and organizations need to avoid using ‘one-size-fits-all’ recommendations, and to consider individual differences in mood and personality when recommending how to manage digital communications. For example, if work-email offers no reward properties to Affiliative extraverts, then they may be encouraged to use more ‘socially’ oriented communications (such as video conferencing, social network sites, e.g. Teams or Slack). Additionally, when fatigued, it could be recommended that Agentic extraverts keep their work-email notifications switched on, as dealing with a new communication can be energising at such times. However, when energy resources are low, Affiliative extraverts would be wise to turn off their work-email notifications, as new incoming messages could further deplete them.

Such recommendations rely on workers having knowledge of their personality traits, and awareness of their mood states. Coaching and executive development programmes may help to sensitize people to their individual preferences and needs, so that workers can decide the appropriate mode for communication, and when these modes should be switched on or off, to optimise energy resources.

Concluding remarks

In this field-based study, we wanted to better understand when, why and for whom work email has a resource boosting or depleting effect on energy resources. By examining how facets of Extraversion interact with pre-email energy resources to boost or deplete energy after dealing with work email, we found that tired, Agentic extraverts are boosted by new, incoming work email – potentially because it affords trait-relevant opportunities to achieve a work goal and engage with a new stimulus. However, we also found that Affiliative extraverts did not experience a boost to energy levels after dealing with work-email, indeed

they appeared to feel even more tired afterwards. These findings have theoretical implications for COR, in that they indicate that personality is best conceptualised as a contextual resource – with certain traits being helpful for boosting resources in some situations, but not others. There are also practical implications. We suggest that providing workers with the autonomy to switch work-email on and off to satisfy personal preferences and mood states can be one way of ensuring that resource differences and needs in workers are accommodated. We now encourage more research on this topic to advance understanding of how personality and energy resources interact to support people as they deal with their work-email demands.

References

- Baethge, A., Rigotti, T., & Roe, R. A. (2015). Just more of the same, or different? An integrative theoretical framework for the study of cumulative interruptions at work. *European Journal of Work and Organizational Psychology, 24*, 308-323. <http://dx.doi.org/10.1080/1359432X.2014.897943>
- Bakker, A. B., Van Der Zee, K. I., Lewig, K. A., & Dollard, M. F. (2006). The relationship between the big five personality factors and burnout: A study among volunteer counselors. *The Journal of Social Psychology, 146*, 31-50. <http://dx.doi.org/10.3200/SOCP.146.1.31-50>
- Barley, S. R., Meyerson, D. E., & Grodal, S. (2011). E-mail as a source and symbol of stress. *Organization Science, 22*, 887-906. <http://dx.doi.org/10.1287/orsc.1100.0573>
- Barrick, M. R., Mount, M. K., & Li, N. (2013). The theory of purposeful work behavior: The role of personality, higher-order goals, and job characteristics. *Academy of Management Review, 38*, 132-153. <http://dx.doi.org/10.5465/amr.2010.0479>
- Bernerth, J. B., & Aguinis, H. (2016). A critical review and best-practice recommendations for control variable usage. *Personnel Psychology, 69*(1), 229-283.
- Beus, J. M., Dhanani, L. Y., & McCord, M. A. (2015). A meta-analysis of personality and

- workplace safety: Addressing unanswered questions. *Journal of Applied Psychology*, 100(2), 481-498. <https://doi.org/10.1037/a0037916>
- Bosch, C., Sonnentag, S., & Pinck, A. S. (2018). What makes for a good break? A diary study on recovery experiences during lunch break. *Journal of Occupational and Organizational Psychology*, 91, 134-157. <http://dx.doi.org/10.1111/joop.12195>
- Brumby, D. P., Cox, A. L., Back, J., & Gould, S. J. J. (2013). Recovering from an interruption: Investigating speed-accuracy trade-offs in task resumption behavior. *Journal of Experimental Psychology: Applied*, 19, 95-107. <http://dx.doi.org/10.1037/a0032696>
- Charalampous, M., Grant, C. A., Tramontano, C., & Michailidis, E. (2019). Systematically reviewing remote e-workers' well-being at work: a multidimensional approach. *European Journal of Work and Organizational Psychology*, 28(1), 51-73.
- Clarke, S., & T Robertson, I. (2005). A meta-analytic review of the Big Five personality factors and accident involvement in occupational and non-occupational settings. *Journal of Occupational and Organizational Psychology*, 78(3), 355-376. <https://doi.org/10.1348/096317905X26183>
- Côté, S., & Moskowitz, D. S. (1998). On the dynamic covariation between interpersonal behavior and affect: prediction from neuroticism, extraversion, and agreeableness. *Journal of Personality and Social Psychology*, 75, 1032-1046. <http://dx.doi.org/10.1037/0022-3514.75.4.1032>
- Czerwinski, M., Cutrell, E., & Horvitz, E. (2000). Instant messaging and interruption: Influence of task type on performance. *OZCHI 2000 Conference Proceedings*, 356, 361-367.
- Daniels, K. (2000). Measures of five aspects of affective well-being at work. *Human Relations*, 53, 275-294. <https://doi.org/10.1177/a010564>

- Deelstra, J. T., Peeters, M. C., Schaufeli, W. B., Stroebe, W., Zijlstra, F. R., & van Doornen, L. P. (2003). Receiving instrumental support at work: when help is not welcome. *Journal of Applied Psychology*, 88(2), 324-331. <https://doi.org/10.1037/0021-9010.88.2.324>.
- Depue, R. A., & Collins, P. F. (1999). Neurobiology of the structure of personality: Dopamine, facilitation of incentive motivation, and extraversion. *Behavioral and Brain Sciences*, 22, 491-517. <https://doi.org/10.1017/S0140525X99002046>
- Diener, E., Larsen, R. J., & Emmons, R. A. (1984). Person× Situation interactions: Choice of situations and congruence response models. *Journal of Personality and Social Psychology*, 47(3), 580-592
- Digman, J. M. (1990). Personality structure: Emergence of the five-factor model. *Annual Review of Psychology*, 41(1), 417-440.
- Eid, M., Riemann, R., Angleitner, A., & Borkenau, P. (2003). Sociability and positive emotionality: Genetic and environmental contributions to the covariation between different facets of extraversion. *Journal of Personality*, 71, 319-346. <https://doi.org/10.1111/1467-6494.7103003>
- Elfering, A., Grebner, S., Semmer, N.K., Kaiser-Freiburghaus, D., Lauper-Del Ponte, S., & Witschi, I. (2005). Chronic job stressors and job control: effects on event-related coping success and well-being. *Journal of Occupational and Organizational Psychology*, 78, 237-252. <https://doi.org/10.1348/096317905X40088>
- Eysenck, H. (1967). *The biological basis of personality*. Springfield, IL: Charles C. Thomas.
- Fisher, C.D. (1998). Effects of external and internal interruptions on boredom at work: two studies. *Journal of Organizational Behavior*, 19, 503-522. [https://doi.org/10.1002/\(SICI\)1099-1379\(199809\)19:5<503::AID-JOB854>3.0.CO;2-9](https://doi.org/10.1002/(SICI)1099-1379(199809)19:5<503::AID-JOB854>3.0.CO;2-9)
- Fritz, C., Lam, C. F., & Spreitzer, G. M. (2011). It's the little things that matter: An

- examination of knowledge workers' energy management. *Academy of Management Perspectives*, 25, 28-39. <https://doi.org/10.5465/amp.25.3.zol28>
- Furnham, A., & Allass, K. (1999). The influence of musical distraction of varying complexity on the cognitive performance of extroverts and introverts. *European Journal of Personality*, 13, 27–38. [https://doi.org/10.1002/\(SICI\)1099-0984\(199901/02\)13:1<27::AID-PER318>3.0.CO;2-R](https://doi.org/10.1002/(SICI)1099-0984(199901/02)13:1<27::AID-PER318>3.0.CO;2-R)
- Furnham, A. (1984). Extraversion, sensation seeking, stimulus screening and type ‘A’ behavior pattern: The relationship between various measures of arousal. *Personality and Individual Differences*, 5(2), 133-140.
- Gabriel, A. S., Podsakoff, N. P., Beal, D. J., Scott, B. A., Sonnentag, S., Trougakos, J. P., & Butts, M. M. (2018). Experience sampling methods: a discussion of critical trends and considerations for scholarly advancement. *Organizational Research Methods*, 22 (4), 969-1006. <https://doi.org/10.1177/1094428118802626>.
- Gardner, D. G., Cummings, L. L., Dunham, R. B., & Pierce, J. L. (1998). Single-item versus multiple-item measurement scales: An empirical comparison. *Educational and Psychological Measurement*, 58, 898-915. <https://doi.org/10.1177/0013164498058006003>
- Geen, R. G. (1984). Preferred stimulation levels in introverts and extroverts: Effects on arousal and performance. *Journal of Personality and Social Psychology*, 46(6), 1303-1312.
- Geldhof, G. J., Preacher, K. J., & Zyphur, M. J. (2014). Reliability estimation in a multilevel confirmatory factor analysis framework. *Psychological Methods*, 19(1), 72-91.
- George, L. G., Helson, R., & John, O. P. (2011). The “CEO” of women's work lives: How big five conscientiousness, extraversion, and openness predict 50 years of work experiences in a changing sociocultural context. *Journal of Personality and Social*

- Psychology*, 101, 812-830. <https://doi.org/10.1037/a0024290>
- Grodin, E. N., & White, T. L. (2015). The neuroanatomical delineation of agentic and affiliative extraversion. *Cognitive, Affective, & Behavioral Neuroscience*, 15(2), 321-334. <https://doi.org/10.3758/s13415-014-0331-6>
- Halbesleben, J. R., Harvey, J., & Bolino, M. C. (2009). Too engaged? A conservation of resources view of the relationship between work engagement and work interference with family. *Journal of Applied Psychology*, 94(6), 1452-1465.
<https://doi.org/10.1037/a0017595>
- Halbesleben, J. R., Neveu, J. P., Paustian-Underdahl, S. C., & Westman, M. (2014). Getting to the “COR” understanding the role of resources in conservation of resources theory. *Journal of Management*, 40(5), 1334-1364. <https://doi.org/10.1177/0149206314527130>
- Hill, A. B. (1975). Extraversion and variety-seeking in a monotonous task. *British Journal of Psychology*, 66, 9-13. <https://doi.org/10.1111/j.2044-8295.1975.tb01434.x>
- Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, 44(3), 513-524. <https://doi.org/10.1037/0003-066X.44.3.513>
- Hobfoll, S. E. (2002). Social and psychological resources and adaptation. *Review of General Psychology*, 6, 307-324. <https://doi.org/10.1037/1089-2680.6.4.307>
- Hobfoll, S. E., Halbesleben, J., Neveu, J. P., & Westman, M. (2018). Conservation of resources in the organizational context: The reality of resources and their consequences. *Annual Review of Organizational Psychology and Organizational Behavior*, 5, 103-128.
- Hobfoll, S. E., & Shirom, A. (2000). Conservation of resources theory: Applications to stress and management in the workplace. In R. T. Golembiewski (Ed.), *Handbook of organization behavior* (2nd ed., pp. 57–81). New York: Dekker.

- Hogan, R., & Hogan, J. (1997). *Hogan Personality Inventory UK edition manual (UK adaptation by G. Hyde & G. Trickey)*. Tunbridge Wells: Psychological Consultancy Ltd.
- Huang, E. Y., & Lin, S. W. (2014). How does e-mail use affect perceived control of time? *Information & Management*, 51, 679-687. <https://doi.org/10.1016/j.im.2014.05.013>
- Hunter, E. M., & Wu, C. (2016). Give me a better break: Choosing workday break activities to maximize resource recovery. *Journal of Applied Psychology*, 101, 302-311. <https://doi.org/10.1037/apl0000045>.
- Jett, Q. R., & George, J. M. (2003). Work interrupted: A closer look at the role of interruptions in organizational life, *Academy of Management Review*, 28, 494-507. <https://doi.org/10.5465/AMR.2003.10196791>
- Judge, T. A., & Zapata, C. P. (2015). The person–situation debate revisited: Effect of situation strength and trait activation on the validity of the Big Five personality traits in predicting job performance. *Academy of Management Journal*, 58(4), 1149-1179. <https://doi.org/10.5465/amj.2010.0837>
- Kinnunen, U., Feldt, T., de Bloom, J., & Korpela, K. (2015). Patterns of daily energy management at work: relations to employee well-being and job characteristics. *International Archives of Occupational and Environmental Health*, 88, 1077-1086. <https://doi.org/10.1007/s00420-015-1039-9>
- Kuppens, P., Oravecz, Z., & Tuerlinckx, F. (2010). Feelings change: Accounting for individual differences in the temporal dynamics of affect. *Journal of Personality and Social Psychology*, 99, 1042-1060. <https://doi.org/10.1037/a0020962>.
- Loukidou, L., Loan-Clarke, J., & Daniels, K. (2009). Boredom in the workplace: More than monotonous tasks. *International Journal of Management Reviews*, 11(4), 381-405.
- Louro, M.J., Pieters, R., & Zeelenberg, M. (2007). Dynamics of multiple-goal pursuit.

- Journal of Personality and Social Psychology*, 93, 174-193.
<https://doi.org/10.1037/0022-3514.93.2.174>
- Luria, G., Kahana, A., Goldenberg, J., & Noam, Y. (2019). Contextual moderators for leadership potential based on trait activation theory. *Journal of Organizational Behavior*, 40(8), 899-911.
- Mazmanian, M. A., Orlikowski, W. J., & Yates, J. (2005). Crackberries: The social implications of ubiquitous wireless e-mail devices. In C. Sorensen, Y. Yoo, K. Lyyhnen & J.I. DeGross (Eds.) *Designing ubiquitous information environments: Socio-technical issues and challenges* (pp. 337-343). Ohio, US: Springer.
- McCrae, R. R., & Costa Jr, P. T. (1997). Personality trait structure as a human universal. *American Psychologist*, 52(5), 509-516.
- McCroskey, J. C., & Richmond, V. P. (1990). Willingness to communicate: A cognitive view. *Journal of Social Behavior and Personality*, 5(2), 19-37.
- Morrone-Strupinsky, J. V., & Depue, R. A. (2004). Differential relation of two distinct, film-induced positive emotional states to affiliative and agentic extraversion. *Personality and Individual Differences*, 36(5), 1109-1126. [https://doi.org/10.1016/S0191-8869\(03\)00204-6](https://doi.org/10.1016/S0191-8869(03)00204-6)
- Nurmi, N. (2011). Coping with coping strategies: How distributed teams and their members deal with the stress of distance, time zones and culture. *Stress and Health*, 27, 123-143.
<https://doi.org/10.1002/smi.1327>
- Ohly, S., Göritz, A. S., & Schmitt, A. (2017). The power of routinized task behavior for energy at work. *Journal of Vocational Behavior*, 103, 132-142.
<https://doi.org/10.1016/j.jvb.2017.08.008>
- Oishi, S., & Choi, H. (2020). Personality and space: Introversion and seclusion. *Journal of Research in Personality*, 85, 103933.

- Penney, L. M., Hunter, E. M., & Perry, S. J. (2011). Personality and counterproductive work behaviour: Using conservation of resources theory to narrow the profile of deviant employees. *Journal of Occupational and Organizational Psychology*, 84(1), 58-77.
- Prapanjaroensin, A., Patrician, P. A., & Vance, D. E. (2017). Conservation of resources theory in nurse burnout and patient safety. *Journal of Advanced Nursing*, 73(11), 2558-2565. <https://doi.org/10.1111/jan.13348>
- Preacher, K. J., Curran, P. J., & Bauer, D. J. (2006). Computational tools for probing interactions in multiple linear regression, multilevel modeling, and latent curve analysis. *Journal of Educational and Behavioral Statistics*, 31, 437-448. <https://doi.org/10.3102/10769986031004437>
- Rasbash, J., Browne, W., & Charlton, C. (2018). *MLWiN version 3.02*. University of Bristol: Centre for Multi-level Modelling.
- Renaud, K., Ramsay, J., & Hair, M. (2006). "You've got e-mail!"... shall I deal with it now? Electronic mail from the recipient's perspective. *International Journal of Human-Computer Interaction*, 21, 313-332. https://doi.org/10.1207/s15327590ijhc2103_3
- Rosen, C. C., Simon, L. S., Gajendran, R. S., Johnson, R. E., Lee, H. W., & Lin, S. H. J. (2018). Boxed in by your inbox: Implications of daily e-mail demands for managers' leadership behaviors. *Journal of Applied Psychology*, 104 (1), 19-33. <https://doi.org/10.1037/apl0000343>
- Rush, J., & Hofer, S. M. (2014). Differences in within-and between-person factor structure of positive and negative affect: Analysis of two intensive measurement studies using multilevel structural equation modeling. *Psychological Assessment*, 26(2), 462-473.
- Russell, E., & Daniels, K. (2018). Measuring affective well-being at work using short-form scales: Implications for affective structures and participant instructions. *Human Relations*, 71(11), 1478-1507.

- Russell, E., Millward Purvis, L., & Banks, A. (2007). Describing the strategies used for dealing with email interruptions according to different situational parameters. *Computers in Human Behavior*, 23, 1820-1837.
<https://doi.org/10.1016/j.chb.2005.11.002>
- Russell, E., Woods, S.A., & Banks, A.P. (2017). Examining conscientiousness as a key resource in resisting email interruptions: Implications for volatile resources and goal achievement. *Journal of Occupational and Organizational Psychology*, 90, 407-435.
<https://doi.org/10.1111/joop.12177>
- Salgado, J.F. (2003). Predicting job performance using FFM and non-FFM personality measures. *Journal of Occupational and Organizational Psychology*, 76, 323-346.
<https://doi.org/10.1348/096317903769647201>
- Sasangohar, F., Donmez, B., Trbovich, P., & Easty, A.C. (2012). Not all interruptions are created equal: positive interruptions in healthcare. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting* (Vol 56, pp. 824-828). Los Angeles, CA: SAGE Publications
- Smillie, L. D., Cooper, A. J., Wilt, J., & Revelle, W. (2012). Do extraverts get more bang for the buck? Refining the affective-reactivity hypothesis of extraversion. *Journal of Personality and Social Psychology*, 103(2), 306-326.
<https://doi.org/10.1037/a0028372>
- Speier, C., Vessey, I., & Valacich, J.S. (2003). The effects of interruptions, task complexity, and information presentation on computer-supported decision-making performance. *Decision Sciences*, 34, 771-797. <https://doi.org/10.1111/j.1540-5414.2003.02292.x>
- Stanton, J. M., Sinar, E. F., Balzer, W. K., & Smith, P. C. (2002). Issues and strategies for reducing the length of self-report scales. *Personnel Psychology*, 55(1), 167-194.
- Ten Brummelhuis, L. L., & Bakker, A. B. (2012). A resource perspective on the work-home

- interface: The work–home resources model. *American Psychologist*, 67(7), 545. DOI: 10.1037/a0027974
- Tett, R. P., & Burnett, D. D. (2003). A personality trait-based interactionist model of job performance. *Journal of Applied Psychology*, 88(3), 500-517.
<https://doi.org/10.1037/0021-9010.88.3.500>
- Thayer, R. E., Newman, J. R., & McClain, T. M. (1994). Self-regulation of mood: Strategies for changing a bad mood, raising energy, and reducing tension. *Journal of Personality and Social Psychology*, 67(5), 910-925. <http://dx.doi.org/10.1037/0022-3514.67.5.910>
- Thompson, M. S., & Cooper, C. L. (2001). A rose by any other name...: A commentary on Hobfoll's Conservation of Resources theory. *Applied Psychology: An International Review*, 50(3), 408–418.
- Trougakos, J. P., Hideg, I., Cheng, B. H., & Beal, D. J. (2014). Lunch breaks unpacked: The role of autonomy as a moderator of recovery during lunch. *Academy of Management Journal*, 57, 405-421. <https://doi.org/10.5465/amj.2011.1072>
- Trougakos, J. P., & Hideg, I. (2009). Momentary work recovery: The role of within-day work breaks. In S. Sonnentag, P.L. Perrewe & D.C. Ganster (Eds.). *Current perspectives on job-stress recovery: Research in occupational stress and well being* (Vol 7, pp. 37-84). Bingley, UK: Emerald Group Publishing Limited.
- Tschabistscher, H. (2019, January 3rd). The number of emails sent per day in 2019 (and 20+ other email facts). *Lifewire*. Retrieved from <https://www.lifewire.com/how-many-emails-are-sent-every-day-1171210>
- Van Veldhoven, M., Van den Broeck, A., Daniels, K., Bakker, A. B., Tavares, S. M., & Ogbonnaya, C. (2020). Challenging the universality of job resources: Why, when, and for whom are they beneficial? *Applied Psychology*, 69(1), 5-29.
- Walji, M., Brixey, J., Johnson-Throop, K., & Zhang, J. (2004). A theoretical framework to

- understand and engineer persuasive interruptions. *Proceedings of 26th Annual Meeting of the Cognitive Science Society* (pp.1417-1422). Mahwah: Lawrence Erlbaum Associates.
- Whittaker, S., & Sidner, C. (1996, April). Email overload: exploring personal information management of email. In *Proceedings of the SIGCHI conference on Human factors in computing systems* (pp. 276-283).
- Winkel, D. E., Wyland, R. L., Shaffer, M. A., & Clason, P. (2011). A new perspective on psychological resources: Unanticipated consequences of impulsivity and emotional intelligence. *Journal of Occupational and Organizational Psychology*, 84(1), 78-94. <https://doi.org/10.1348/2044-8325.002001>
- Woods, S. A., & Anderson, N. R. (2016). Toward a periodic table of personality: Mapping personality scales between the five-factor model and the circumplex model. *Journal of Applied Psychology*, 101, 582-604. <https://doi.org/10.1037/apl0000062>.
- Yang, Y., & Green, S. B. (2011). Coefficient alpha: A reliability coefficient for the 21st century? *Journal of Psychoeducational Assessment*, 29(4), 377-392.
- Zacher, H., Brailsford, H. A., & Parker, S. L. (2014). Micro-breaks matter: A diary study on the effects of energy management strategies on occupational well-being. *Journal of Vocational Behavior*, 85, 287-297. <https://doi.org/10.1016/j.jvb.2014.08.005>
- Zhu, Z., Kuykendall, L., & Zhang, X. (2019). The impact of within-day work breaks on daily recovery processes: An event-based pre-/post-experience sampling study. *Journal of Occupational and Organizational Psychology*, 92, 191-211. <https://doi.org/10.1111/joop.12246>.
- Zijlstra, F. R., Roe, R. A., Leonora, A. B., & Krediet, I. (1999). Temporal factors in mental work: Effects of interrupted activities. *Journal of Occupational and Organizational Psychology*, 72(2), 163-185.

Table 1. Descriptive statistics and inter-correlations between explanatory variables

	Variable	N	Mean	SD	1	2	3	4	5	6	7	8
<u>Level-1</u>												
1	Email Number	589	10.89	6.17								
2	Email Demands	565	9.45	4.11	.06							
3	Email Valence	579	2.31	0.68	.03	-.02						
4	Before BE	572	8.73	1.94	-.03	.02	.00					
5	Before FV	572	7.58	1.89	-.01	.13**	.06	.68**				
6	After BE	580	8.72	1.98	-.02	.04	.04	.91**	.66**			
7	After FV	580	7.59	1.92	-.02	.13**	.06	.63**	.91**	.66**		
<u>Level-2</u>												
8	Agentic extraversion	49	20.00	5.36	-.02	.26	.03	.31*	.39**	.34*	.41**	
9	Affiliative extraversion	49	13.33	5.01	-.12	-.16	-.25	-.12	-.13	-.13	-.16	.17

Note. Level 2 variables are presented prior to transformation and correlated with person averages for the Level 1 variables. Two tailed significance reported: * p <0.05; **p<0.01

Table 2. *Model one: Predicting ‘Boredom-Enthusiasm’ after dealing with new work-email*

		Step 1:	Step 2:	Step 3:
	Null Model	Controls	Main effects	Interaction terms
Intercept	8.72 (.24)**	8.72 (.24)**	8.66 (.24)**	8.65 (.24)**
Control Variables:				
Email Number		0.01(.01)	0.01(.01)	0.01(.01)
Email Demands		-0.00 (.00)	-0.00 (.00)	-0.00 (.00)
Email Valence		0.12 (.07)*	0.10 (.07)	0.10 (.07)
Fixed Effects:				
Before BE			0.19 (.03)**	0.29 (.04)**
Affiliative extraversion			-0.35 (.24)	-0.35 (.24)
Agentic extraversion			0.65 (.24)**	0.67 (.24)**
Interaction Effects				
Before BE * Agentic extraversion				-0.17 (.04)**
Before BE * Affiliative extraversion				-0.02 (0.04)
Model				
Level 1 variance	0.97 (.06)**	0.97 (.06)**	0.88 (.06)**	0.84 (.05)**
Level 2 variance	2.98 (.60)**	2.97 (.60)**	2.58 (.55)**	2.69 (.55)**
2* Log Likelihood	1804.14	1777.92	1582.14	1557.89
	(N=580)	(N= 570)	(N= 524)	(N= 524)
Improvement in fit (X^2)		26.22 (3df)**	195.78 (2df)**	24.25 (2df)**
from previous step.				

Note. Two-tailed significance: * $p < 0.05$; ** $p < 0.01$. Standard errors are in parentheses. All level 1 predictors are person-mean centered.

Table 3. *Model two: Predicting ‘Fatigue-Vitality’ after dealing with new work-email*

		Step 1:	Step 2:	Step 3:
	Null Model	Controls	Main effects	Interaction terms
Intercept	7.74 (.23)**	7.73 (.23)**	7.55 (.21)**	7.55 (.21)**
Control Variables:				
Email Number		0.03 (.01)**	0.02 (.01)*	0.02 (.01)*
Email Demands		-0.00 (.00)	0.00 (.00)	0.00 (.00)
Email Valence		0.19 (.08)**	0.08 (.06)	0.07 (.06)
Fixed Effects:				
Before FV			0.44 (.03)**	0.49 (.03)**
Affiliative extraversion			-0.42 (.21)*	-0.42 (.21)*
Agentic extraversion			0.74 (.21)**	0.76 (.21)**
Interaction Effects				
Before FV * Affiliative extraversion				-0.07 (.03)**
Before FV * Agentic extraversion				-0.13 (.03)**
Model				
Level 1 variance	1.25 (.08)**	1.23 (.08)**	0.80 (.05)**	0.75 (.05)**
Level 2 variance	2.73 (.56)**	2.73 (.56)**	1.94 (.42)**	1.97 (.42)**
2* Log Likelihood	1935.53	1897.14	1520.28	1493.85
	(N=580)	(N=570)	(N=524)	(N=524)
Improvement in fit (X^2)		38.39 (3df)**	376.86 (3df)**	26.43 (2df)**
from previous step.				

Note. Two-tailed significance: * $p < 0.05$; ** $p < 0.01$. Standard errors are in parentheses. All level 1 predictors are person-mean centered.

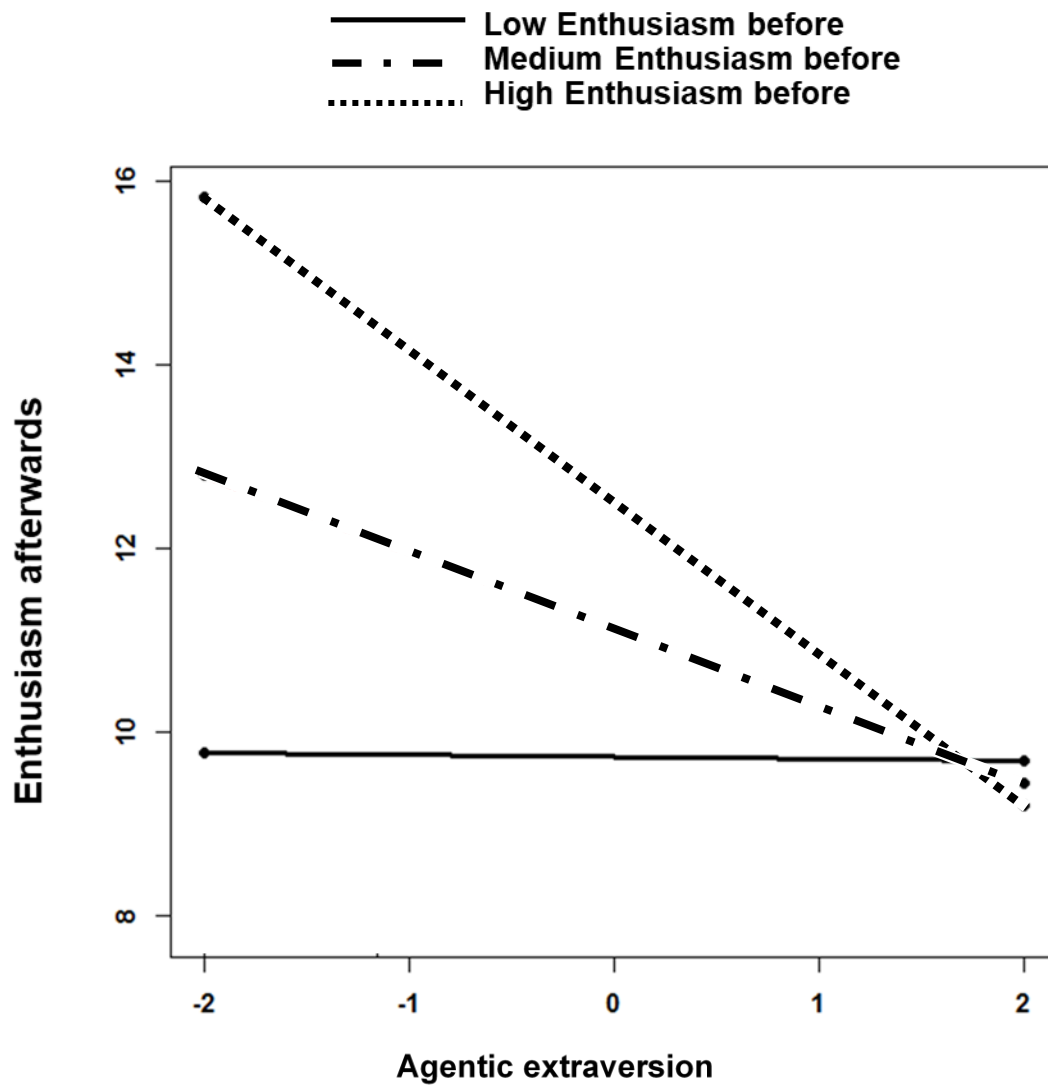


Figure 1. The impact of Agentic extraversion on enthusiasm after dealing with new work-email (After BE), as moderated by prior enthusiasm (Before BE) levels.

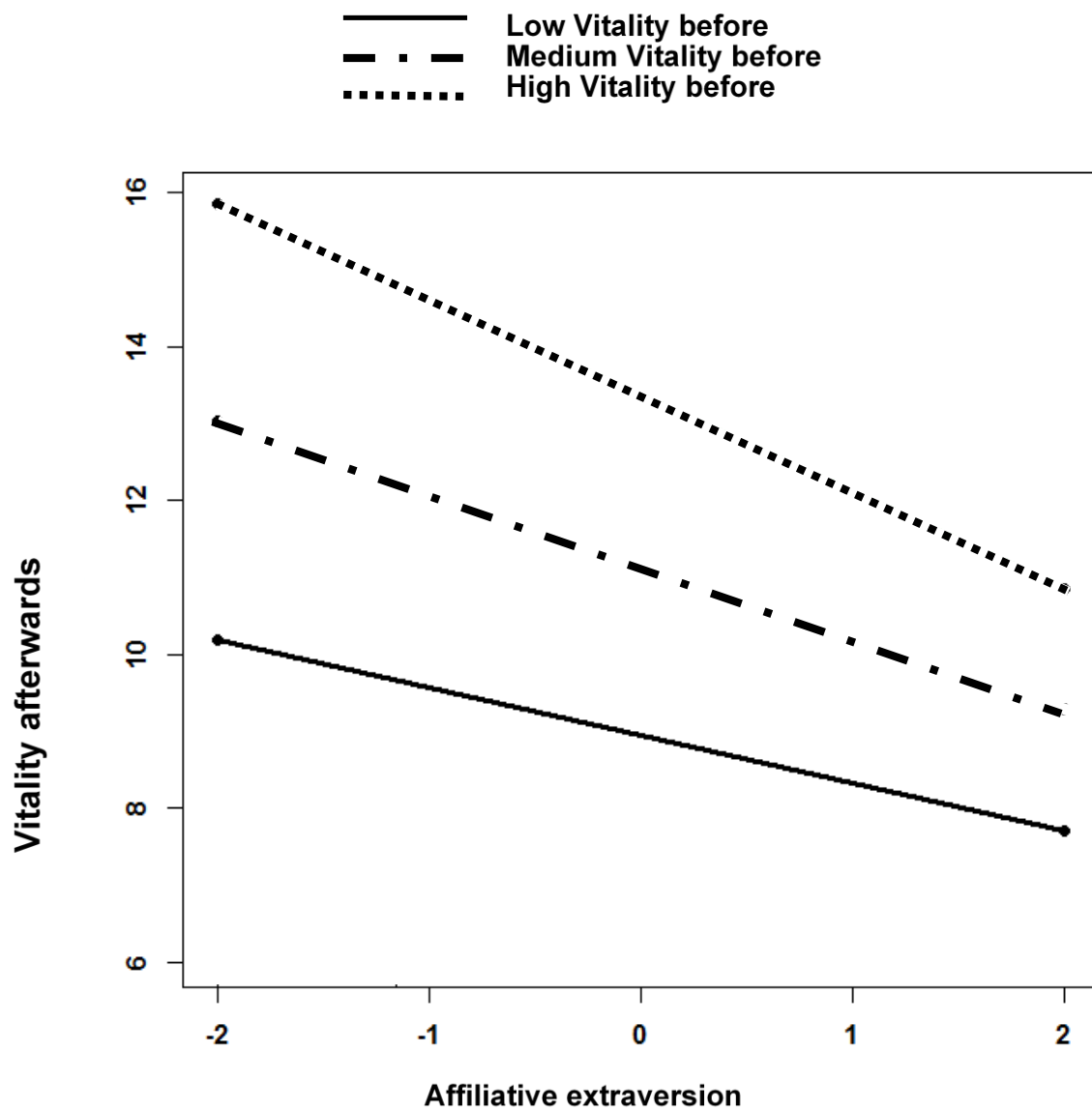


Figure 2. The impact of Affiliative extraversion on vitality after dealing with new work-email (After FV), as moderated by prior vitality (Before FV) levels.

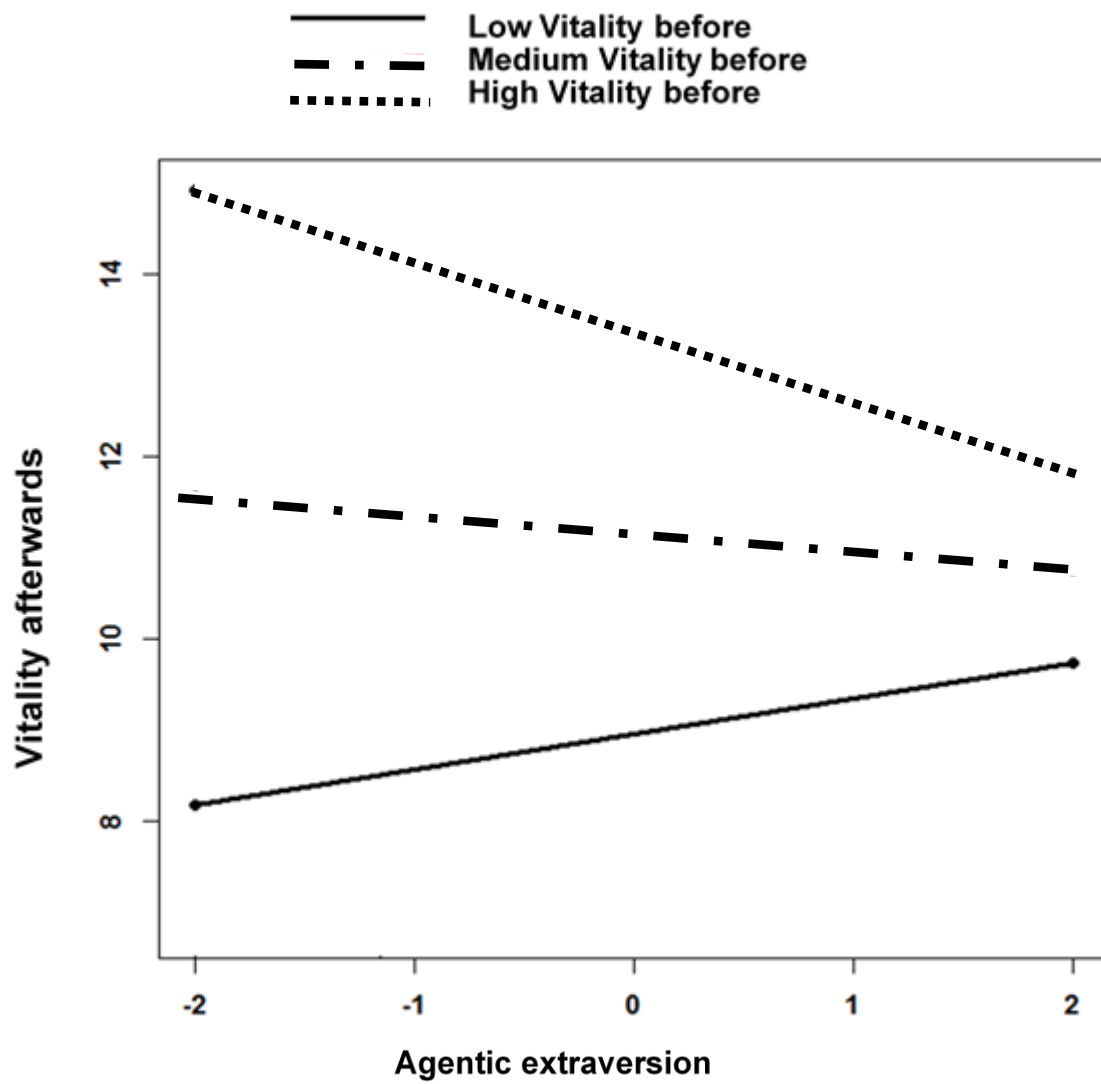


Figure 3. The impact of Agentic extraversion on vitality after dealing with new work-email (After FV), as moderated by prior vitality (Before FV) levels.

ENDNOTES

ⁱ Although note that ‘openness’ is associated with roles requiring propensity for adventure.

ⁱⁱ Compared with other traits on the FFM (Tett & Burnett, 2003).

ⁱⁱⁱ Extraversion represents a construct whereby lower levels are related to Introversion and higher levels are related to Extraversion. Throughout this manuscript, when referring to higher levels of Extraversion, or extraverts being ‘more’ X or ‘less’ Y, this is in comparison to those at lower ends of the scale (e.g. more introverted people).

^{iv} Bernerth and Aguinis (2016) state that control variables should only be included in models when there is theoretical justification. Including controls because (i) other studies have previously included these, (ii) they are correlates of other predictors, or (iii) they are used as the basis for establishing incremental validity of hypothesized predictors, is considered to be inappropriate. On this basis, we decided not to include other FFM variables as controls in this study. However, as we appreciate that readers may be interested to know if other personality characteristics could be predictive of energy change, we entered all of the personality variables from the HPI into alternative Step 2 models (after entering controls at Step 1). For both After FV and BE, no personality characteristic – apart from Agentic extraversion (Ambition) - was significant. These results are available in a supplementary online appendix.

^v Conceptual distinctiveness of the scales used in this study is assumed on the basis that the energy-level scales have been subjected to a recent cross-study (and high N) multi-level CFA that established the acceptability of FV and BE as distinctive scales (Russell & Daniels, 2018). Email Demands is the only other multi-item level-1 scale and this is not significantly correlated with any other used in this study (see Table 1). CFA on the HPI has been undertaken by the test publishers, who also report alpha coefficients of 0.83 (Affiliative Extraversion) and 0.80 (Agentic Extraversion). We are unable to calculate our own alphas for these scales, as item loadings are not available, owing to the proprietary nature of the HPI. Note that alpha coefficients are not recommended for use with 2-item scales – especially when the items are semantically opposite to each other (Geldhof, Preacher & Zyphur, 2014; Rush & Hofer, 2014; Russell & Daniels, 2018; Stanton, Sinar, Balzar & Smith, 2002; Yang & Green, 2011).